

A U.S. Perspective on Multifunctionality

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A U.S. Perspective on Multifunctionality¹

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Providing a U.S. perspective on multifunctionality is a difficult task because the term has not been adopted in the United States. A search of the USDA web site for references to multifunctionality provides a very short list of hits and the bulk of these come in the form of speeches by USDA officials on trade issues. In these speeches multifunctionality is listed as a potential source of trade friction between the United States and Europe because multifunctionality has the potential to provide subsidies to European farmers that will reduce the competitive position of American exports.

Other than this type of reference, which is never fully developed, the term has no real standing in agricultural policy discussions in the United States. However the underlying premises that make multifunctionality an important topic in Europe are also a central part of U.S agricultural policy. These include a concern with the environmental and wildlife habitat consequences of farming, the link between agriculture and rural development, and the amenity value of farms. This is evident by the inclusion of multiple references in *Food and Agricultural Policy*, the most recent USDA farm policy document, to the importance of recognizing the multiple outputs of agriculture and of forming policy that is sensitive to them (for example, USDA 2001, p.2, p.10, p.16).

It seems then that a critical question requiring more thought is, why is the concept important in Europe and not in the United States? In both regions agriculture exhibits similar characteristics in terms of production technology and share of GDP, and both societies are at the same level of economic development and share similar values. Further, both societies articulate similar goals for agriculture that start with the production of food and fiber but also include various social and environmental aspects.

Recently the OECD has developed a reasonable technical approach to the study of multifunctionality that explores the issues of jointness of production and the relevance of various externalities (OECD, 2001). This means that there is little to be gained by reinventing that work in detail. However, it is worth pointing out that the OECD document is skeptical of the relevance of two of the common externalities suggested by proponents of multifunctionality as grounds for legitimizing payments to farmers. These are rural development benefits and food security considerations (OECD, 2001; p.13). Essentially the OECD argues that in the first case employment changes are best thought of as falling into the category of pecuniary externalities, which are the inevitable consequence of any shift in demand patterns and which rarely require compensation (Heller and Starrett, pp.16-18). In the case of food security the argument is that efforts to preserve local agriculture may actually decrease security (OECD 2001; p. 47-48).

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Ironically a more recent OECD publication that synthesizes country reports on jointness in agriculture notes that the United States identifies rural economic viability is one of four non-commodity outputs associated with agricultural production, along with landscape and open space amenities, loss of bio-diversity and water pollution (Adler 2001a, p. 4).

The balance of the paper will provide an explanation of why the United States has not been receptive to idea of multifunctionality. This is not to suggest it will never accept the merits of the argument, but before multifunctionality enters the vernacular of U.S. agricultural policy there will have to be significant changes in what Americans expect from national agricultural policy.

Definitions

Before proceeding further I will provide a small number of definitions. These are important because they involve terms that are either not common, or the definitions are somewhat novel. In some cases the definitions are mine, although they are derived from a broader literature, in other cases a specific source is identified.

Agriculture: The systematic process of transforming a natural environment so that some species of plant or animal that are desirable sources of food or fiber are favored over others.

Desertification: The abandonment of land by humans with the resulting effect of removing the forces that are necessary to maintain the environmental structure .

Multiple-Use: "... the judicious use of land so as to best meet the needs of the American people. Such management it is stated, may result in the production of either some or all of the resources and services on each particular area of land. The chosen combination of uses need not provide the greatest possible financial return or provide the greatest unit output. However; such management should reflect consideration of the relative values of the multiple-use outputs." (Bowes and Krutilla, p.32)

Multifunctionality: "The key elements of multifunctionality are: i) the existence of multiple commodity and non-commodity outputs that are jointly produced by agriculture; and ii) the fact that some of the non-commodity outputs exhibit the characteristics of externalities or public goods, with the result that markets for these goods do not exist or function poorly. (OECD 2001, p. 13)."

The Context

It is important to recognize that a consequence of farming is a significant transformation of the original environment. In this process some species are driven out, possibly to the point of extinction, and others are either given advantages or are introduced from other areas. This suggests that in general the longer an area has been engaged in commercial agriculture the less its ecosystem resembles the initial natural state. In Europe there is very little land that can be thought of as natural since people have managed the land according to their needs for multiple centuries. By contrast there are

large parts of North America, including much of the United States, where active land management is either recent or has never taken place.

This I believe leads to a very different perception of what is a natural environment. For most Europeans nature consists of ecosystems that have been significantly altered by human action, whereas for most Americans nature has a connotation of wilderness, or land that has had very limited transformation through human contact. In a European context removing the influence of people on the environment leads to undesirable change because stability of the current ecosystem relies upon ongoing human intervention.

This suggests an explanation for another European term that has no current standing in North America - desertification. For many Europeans it is difficult to imagine land without people. Thus multifunctionality can be seen as a logical response to the effects of rural population decline. With fewer people in a rural region the ongoing investment that is required to maintain the existing level of infrastructure and environmental management systems will not take place without government intervention.

By contrast large areas of the United States continue to experience population loss with no real national level social or public policy consequences. While Americans appear to be concerned with urban sprawl - the conversion of farmland to urban uses, they have almost no interest in the land conversion process taking place at the other edge of agriculture. Farm abandonment is a common phenomenon in the United States as production becomes concentrated on the more fertile and more easily managed parcels of land. Similarly the steady increase in the average size of farms leads to lower population densities and reduced levels of rural social services and public infrastructure. In some parts of the Central Plains the population peaked in the 1920s and has steadily declined ever since. In a number of states far more farmland has been abandoned than has been lost to urban expansion. Similarly the history of the United States is replete with the story of ghost towns - places that were once prosperous but have been abandoned.

As Figures 1-3 show in the period 1945 -1997, while the population increased from 140 million to 268 million, the quantity of farmland in the United States stayed relatively constant at just over 1,000,000,000,000 acres, or about 60 percent of all land in the continental U.S.. Even though the amount of land in urban areas more than quadrupled the net effect on total land in farms was not that significant. Indeed in some parts of the country the quantity of farmland declined and then rose again. In the Corn Belt (Illinois, Indiana, Iowa, Missouri and Ohio) the amount of land in farms fell after World War II, rose in the late 1950s, and just recently fell to the level in the post-war era. Despite the decline farmland still accounts for roughly 70 percent of land in the region.

The Northeast region (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware and Maryland) is striking in that it experienced the largest decline in the share of farmland in the nation, from 35

billion acres to 16 billion. Urban land increased from 4 billion acres to 11.5 billion in the same period but even if all the urban expansion took place on farmland, some 11.5 billion acres went into another use - typically unmanaged forest. What makes the Northeast experience important is that it is both the most densely settled part of the nation and the part with the longest history of settlement. Many of the farms that went out of operation had their origins in the colonial era. While this region has the largest number of farm preservation programs, even here they are rarely significant public policy issues at the local or state level.

While multifunctionality is a term that became popular in the 1990s and is applied primarily to farming, in the United States the idea of multiple-use originated in the last years of the eighteenth century as a principle for forest management. The two concepts are very similar. In both cases they recognize that an economic activity on a parcel of land has multiple outputs only some of which have a functioning market, but each having some value, positive or negative, to at least some group of people.

Multiple-use management of public lands is now a central principle for forests and range land and for river management. In each of these cases public policy initially emphasized a single activity, tree harvesting, livestock grazing and navigation or flood control and endorsed practices that maximized the benefits from that activity. Over time those who placed a value on other outputs that were adversely affected by the emphasis on producing the target good began to try to influence public policy. Initially this process was driven by local concerns but it steadily became more centralized with national objectives becoming part of the management process. In 1960 the U.S Forest Service was formally required by the Multiple Use Sustained Yield Act to consider competing and complementary uses for forests. These requirements were steadily expanded by legislation through the rest of the 1960s and the 1970s and extended to range land and rivers.

The significance of these decisions for the management of public resources is best expressed by Jack Ward Thomas.

“Each Act and the subsequent federal court decisions that scored the agencies attempts to obey these laws turned the screw tighter. The thrust was clear - national forest management will ensure attention to multiple use, to wilderness, and to wild and scenic rivers. All proposed management actions will be analyzed for environmental and economic effects, management plans will deal with the retention of diversity in plant and animal communities and rare forms of plant and animal life will be protected.” (emphasis authors) Thomas, p.4.

Problems With Multifunctionality

Given its long experience with multiple-use an obvious question is why has the United States not embraced multifunctionality? It is obvious that there is not a lot of difference between multiple-use and multifunctionality as far as concepts go, but there important differences in the evolution of the two ideas as distinct pieces of public policy. Multifunctionality is a recent term that came out of European discussions of

sustainability in the early 1990s. It reflects efforts to operationalize the ideas of sustainability in the context of farming practices. In this case the concept or theory came first and there is now an effort to take the concept and implement it as an auxiliary element in a largely private sector, agriculture. As Adler puts it: "The primary function of agriculture is to supply food and fibre. However, agriculture can also be a source of several non-commodity outputs and negative externalities. (Adler, 2001b; p.4).

By contrast multiple-use developed as a management practice in forests in the 1900s as demand patterns shifted in ways that made outputs other than timber more significant in the surrounding communities. Individual forests were managed according to plans that reflected the local interests in specific outputs. Thus multiple-use originated as management practice grounded in specific resource endowments and specific demands. Over time certain practices were established as agency policy and in the 1960s were codified as legislation. In the 1970s as notions of sustainability and ecosystem management developed, multiple-use was redefined in the context of sustainability.

This difference in the way policies develop has been recognized in other contexts as being significant. In comparing the U.S. and European approaches to rural development Jean Francois-Poncet noted that in Europe there is a tendency to first develop a conceptual structure capable of analyzing the policy that can then be used to develop a holistic strategy to address it. By contrast in the United States there is tendency for individuals or small groups to seize the initiative and develop their own pragmatic solutions which over time are assembled into a larger program (OECD, 1997; p.13).

While multifunctionality is seen by its proponents as an innovative new option to address current problems in the farming sector, multiple-use in the United States is a time-worn policy that has been modified extensively to suit changing conditions in the management of public resources. This difference in perceptions and fundamental differences in the nature of agriculture and the policy environment can provide a set of reasons for American skepticism and European enthusiasm.

First, multiple-use in the United States has been a tool to manage public lands and waterways, not private property. Altering property rights in the United States is an exceedingly sensitive issue and while there is considerable precedent for government to modify property rights when the public interest is clear, there is also a considerable reluctance to use this power frequently. In particular because farmers have worked hard to build and maintain an image as sound stewards of the land, there is an additional presumption that farmers, with few exceptions, manage land in an environmentally sound manner. This makes it an uphill battle to argue there is a federal role in the management of farm land.

Second, U.S. policy has tended to address adverse environmental consequences of agriculture on an issue by issue basis. For example, there are incentives for farmers to adopt conservation plans that involve whole-farm management practices. there is

legislation to limit “sod-busting” and “swamp-busting” which is intended to keep land that should not be converted to crop land out of production. The “Conservation Reserve” has as part of its purpose the removal of low productivity, environmentally sensitive land from production. Over the last few decades various farm bills have made significant amounts of federal money available to farmers to modify their production practices in ways that should reduce the adverse environment consequences of farming. The positive externalities associated with farming have generally not been significant national policy issues..

Third, land-use management in the United states is generally seen as a local issue, not a state issue and certainly not a federal issue. When states do get involved in land use issues it is generally through enabling legislation that provides local governments with the authority to adopt requirements for land use. The separation of powers in the Constitution places major limits on federal authority; except on federal lands which constitute a huge percentage of the western half of the country (Figure 4).

At a local level it is possible to find many of the tools being considered to implement multifunctionality in use. Various jurisdictions have established zoning regulations that block the conversion of farmland to other uses, other places have established funds to purchase development rights from farmers, still other places employ lower tax rates for farmland but recoup the difference if the property is developed. In each of these cases the community has determined that it has a local interest in preserving a landscape that includes agriculture.

However, the edge or boundary between urban development and farming is not always comfortable. While people tend to like agriculture in principle, they often dislike it as a neighbor. Farmers produce: odors from livestock, dust from cultivation, noise from livestock and field operations, and traffic congestion when they move machinery on roads, plus they are usually opposed to higher property taxes that are necessary to fund improved local services. Thus the actual experience with preserving farms is often less desirable than the concept suggests. The conflicts can reach a serious enough level that many states have enacted “right to farm” laws that limit the ability of local governments to regulate farming practices.

Fourth, given the size of the United States and the relatively high and growing degree of urbanization (76% of the population in 1990), most agricultural production takes place well away from where most people live and most people have no personal ties to agriculture. Not only are most people urban residents, very few have any relatives engaged in agriculture. While most people have general concerns about agricultural production it is largely an abstract concern; not a concern with practices on specific farms or the well being of particular farmers.

Despite the relative success of farm organizations in continuing to perpetuate the myth of small family farms being the bedrock of the nation (Hanson), many people now see farming as a commercial enterprise that may already receive too many government subsidies and not too few. One manifestation of this is the lack of concern with farm

abandonment and rural decline. For some urban residents an increase in the amount of “wilderness” because of farm abandonment may actually be an improvement. Recall desertification is not an issue in the United States. As a result farming is now more a part of the popular culture of the past and not the present. This means that there may be a real reluctance to fund programs for the group of mostly wealthy people engaged in agriculture when there are competing demands for public funds, especially when the average citizen receives no visible benefits from the outlay. Thus one of the main premises of multifunctionality – a desire to preserve a rural way of life does not fit well with American values.

Recent USDA analysis shows that commercial farms, those with gross sales in excess of \$250,000, account for just 8% of all farms but produce 68% of total agricultural production and receive 47 percent of government payments, primarily from commodity price support programs (USDA 2001; Appendix 1). Their average total household income is \$135,000 which is 2.7 times larger than the average U.S. household income of just over \$51,000 and their net worth, or wealth, is far in excess of the average American family (Table 1). It is hard to argue that these individuals are deserving of more subsidies. Similarly the largest group of farmers, the rural life-style group account for 62% of farms and have an average household income of more than \$67,000. While they do not currently get a large share of government payments it is equally difficult to argue they should be the recipients of government support. Only the intermediate group with average income of just over \$43,000 might qualify as somewhat disadvantaged, but a more targeted program would make better public policy.

Fifth, embracing multifunctionality would require a major rethinking of U.S. agricultural policy. A new farm bill is under consideration this year and although there was an effort in the House of Representatives to refocus federal support on smaller farms and on environmental and amenity values, it was soundly defeated. Whether these issues will resurface in the Senate is still to be determined, but the forces willing to preserve the existing program structure are formidable. U.S. farm policy is now organized on a commodity basis and those large farmers who produce the bulk of commodities and receive the bulk of payments have a strong incentive to maintain the status quo. Arrayed against them is a large, but loose, coalition of environmentalists, small farm advocates and people concerned with waste in government. But the members of the coalition want different alternatives and for the most part lack the financial and political resources to compete effectively with the commodity groups (Freshwater).

In addition the current structure of U.S. agriculture has reached a stage where multifunctionality is not an appealing option to most farm households. Families on small farms derive little income from agriculture. Indeed the most valuable government policy to them is the ability to shelter income in their farm due to preferential tax treatment. In addition they make greater use of programs that withdraw land from production, further reducing their role in total agricultural output. For this large group of farm families, the farm is already a lifestyle decision and arguably they are already operating their farm in a way that maximizes its non-market outputs.

The relatively small number of commercial farms on the other hand have a vital stake in preserving the existing structure of commodity programs, because they account for a significant share of their income. Commodity programs have led U.S. farmers to organize by commodity interest rather than as a single group. Members of each commodity group believe that any shift in payment structure can only leave them worse off, because the total level of payments is unlikely to expand enough to cover the amount going to new recipients. Further, membership of the House and Senate Agriculture Committees, where legislation originates, is dominated by individuals from states and regions where the existing policy system is both important and beneficial. It is hard to imagine why they would embrace policies that if adopted would harm key constituents.

From a national perspective, the simple fact that the United States produces far more food and fiber than it consumes and requires export markets to absorb the surplus also leads to a concern with how multifunctionality develops as a policy. Recall the main mention of multifunctionality on the USDA web site was in the context of a potential trade barrier. Historically a U.S. policy that was geared to increasing production required a parallel policy to stimulate exports. Even if policy becomes neutral in terms of promoting increased output, there will still have to be steady growth in world markets to absorb residual increases in farm output. One of the lessons of past U.S. policy of decoupling payments from production is that farmers at an individual level respond to lower incomes by increasing their own production. In price inelastic markets the resulting increase in supply makes everyone worse off because prices fall faster than output grows. Further there is a perhaps unfounded impression in the United States that much of the support for implementing multifunctionality currently comes from countries with a relatively high cost agricultural sector.

A sixth explanation for the lack of enthusiasm with multifunctionality can be found in the experience with multiple-use on public lands. Despite considerable effort over a long period of time to implement multiple use management on public lands there is still little agreement on how it should be done. Public forests have experimented with multiple-use management in various forms for over 100 years. While much of the experience has been positive in the sense that social welfare is probably higher than it would be if timber harvesting had dominated forest management, the difficulties of introducing a management policy that involves both market and non-market goods should not be minimized. The essential problem with valuing non-market outputs is that no method can claim broad support and so any plan can be easily challenged..

Arguably the concept of balancing multiple outputs should be easier on public lands because while there are some outputs that have market prices the public sector is rarely under pressure to operate its enterprises to maximize profits. Further it is easier to have a policy implemented by employees of an agency than by independent agents who have their own set of objectives. Farmers have a long history of taking government money and using it to implement actions that are in each individual's best interest. While it is possible to monitor compliance and penalize those who do the wrong thing, this can be an expensive process and raises the price of the policy.

Returning to the development of multiple-use and multifunctionality policies, it is important to think of the scale at which they are to be operated. It is easy to say that agriculture is multifunctional, but at the farm level what outputs should be produced and who makes the decision? Are all outputs required on all farms, and if not how much specialization is allowed. Unless outputs occur in fixed proportions, which is an uninteresting case, how do you provide appropriate signals to individual producers so they produce the optimal mix of market and non-market outputs? If farms can specialize, can regions? At what level of geography do we require a mix of outputs and what outputs are part of that mix?

Each national forest in the United States has a management plan that tries to ensure that all outputs are considered and produced in the appropriate proportions. Several decades ago the Forest Service experimented with large quantitative optimization models in the hope that the process of developing the ideal plan could be converted to a series of equations that would defuse conflict. Not surprisingly the resulting plans were opposed by as many people as supported them. This reflected the unfortunate reality that in many cases a desirable output for one group is an undesirable one for others. For example, in the Forest Service experience off-road vehicles and snowmobiles are very popular uses for one group of people and an anathema to another. If both groups have standing as part of the public constituency, how can they both be reconciled? Every management plan invites litigation by a group that believes the outputs it favors are being under produced or the outputs it dislikes are being over produced. The result is huge expenditures on legal fees and court imposed moratoriums on implementing the plans. Perhaps the United States is unduly litigious, but it is probably a mistake to assume that there will be unanimous enthusiasm in any country over the way multifunctionality is implemented.

A potentially serious source of conflict could be the interests of land owners as opposed to farm operators. Since roughly half of all land operated in the U.S. is rented or leased, and particular parcels can move from one condition to another unpredictably it will be important to find ways to reconcile the different interests of these two groups. Who is responsible for ensuring multifunctionality objectives are met on a parcel of land and what incentives do they have to fully comply?

Concluding Observations

Lexington, Kentucky provides an agricultural example of local efforts to apply multifunctionality. Because Lexington is home to the best Thoroughbred horses in the world, horse farms in Lexington command very high values; and are owned by some of the wealthiest people in the world, very few of whom actually live in Lexington or spend much time there. Horse farms provide a particularly high amenity value to the local population both in terms of visual esthetics and in terms of giving Lexington a global visibility. Recently the local government became concerned with urban sprawl and instituted a purchase of development rights program whereby farm owners are encouraged to sell the right to convert their farm to housing, a golf course or industrial uses.

in principle this is a clear recognition of the multifunctionality of agriculture and an effort to internalize an externality by providing a payment to farmers to reflect a non-market output. As a practical policy it has been a failure. First the opposition to using public money to pay very rich individuals to do something they are likely to continue to do anyway was intense. Second the amount of money needed to buy enough options from these individuals to make a meaningful effort in preserving the esthetics of the community was far in excess of available funds. And the effect of Lexington restricting development in its jurisdiction has been greater development pressure in the ring of counties that surround Lexington, so sprawl has pushed out even farther.

One might say that this is an extreme example and it is. However, where is the national interest in preserving what are for the most part local amenities? If most of the unpriced outputs are primarily of local benefit should we be looking to local sources of revenue to pay for them. Some may argue that farming is part of our heritage and deserves preservation. But how much, and by whom? In recent years many small communities in rural areas of the United States have tried to find a new use for old school buildings that have been closed due to some combination of falling population in the region and obsolescence. many have been converted to museums to preserve and display the local history, much of which involves farming. However very few of these museums receive any significant number of visitors and very few have anything of particular historical significance. However almost all of them require a steady infusion of time and money by the community, both of which are scarce resources that have opportunity costs.

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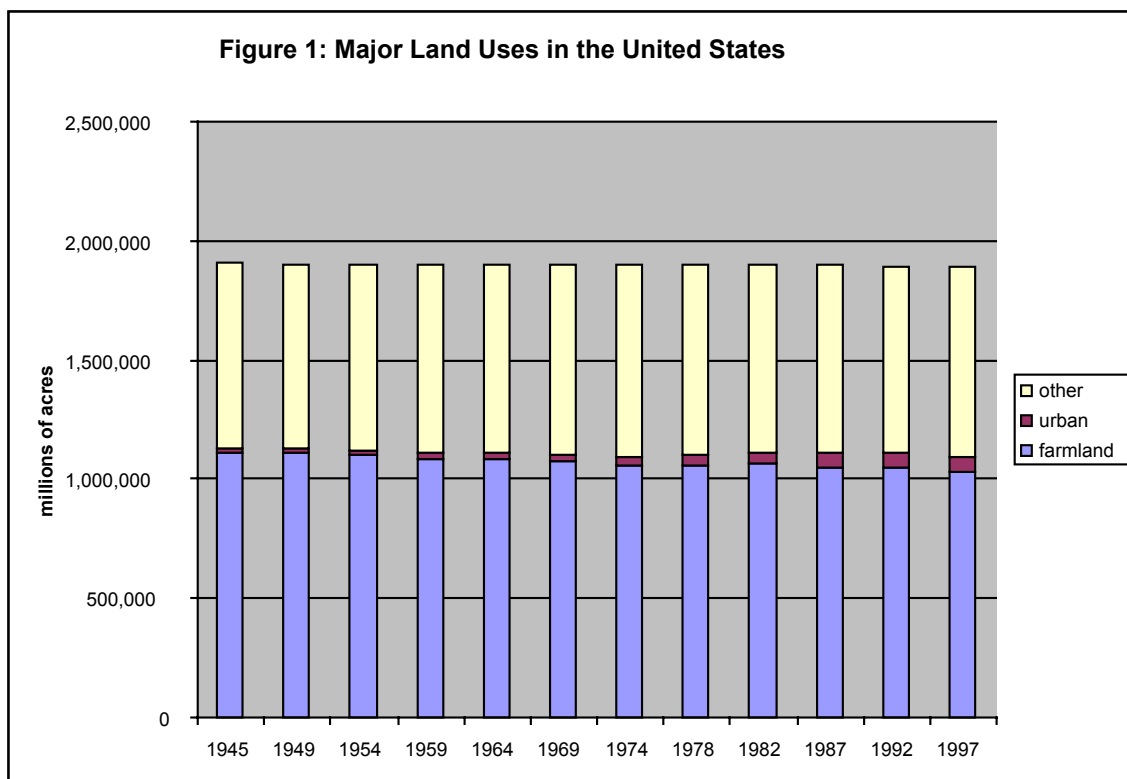
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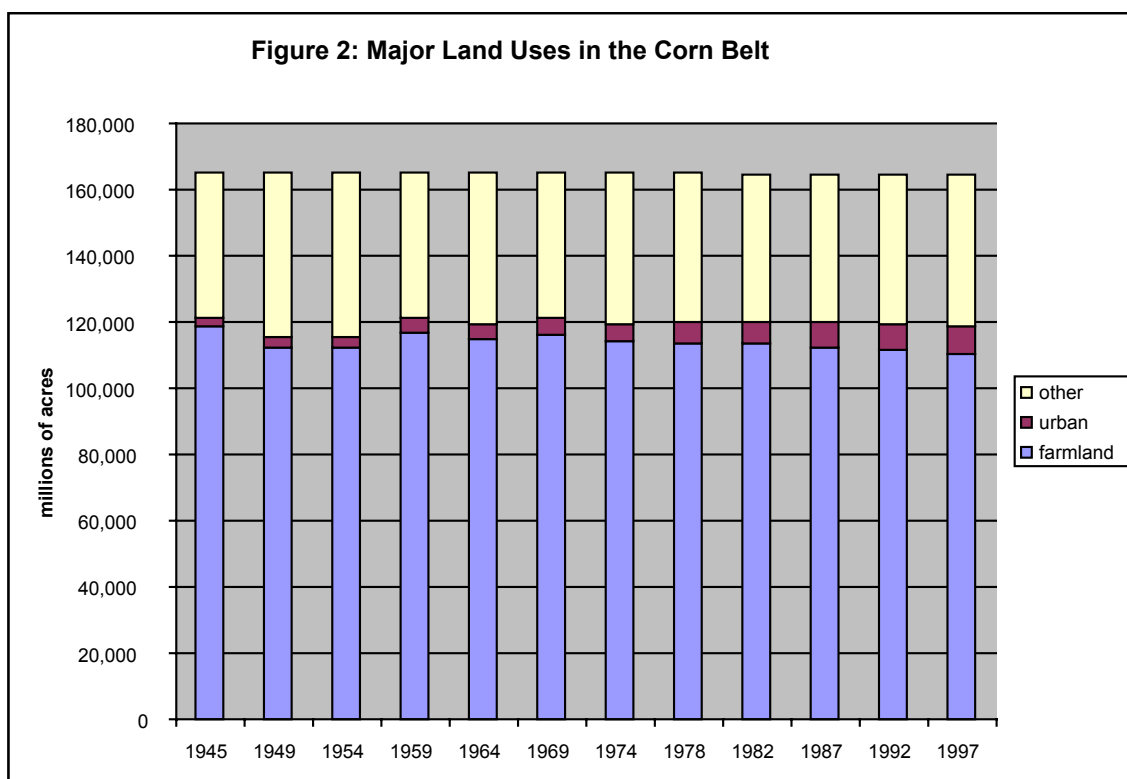
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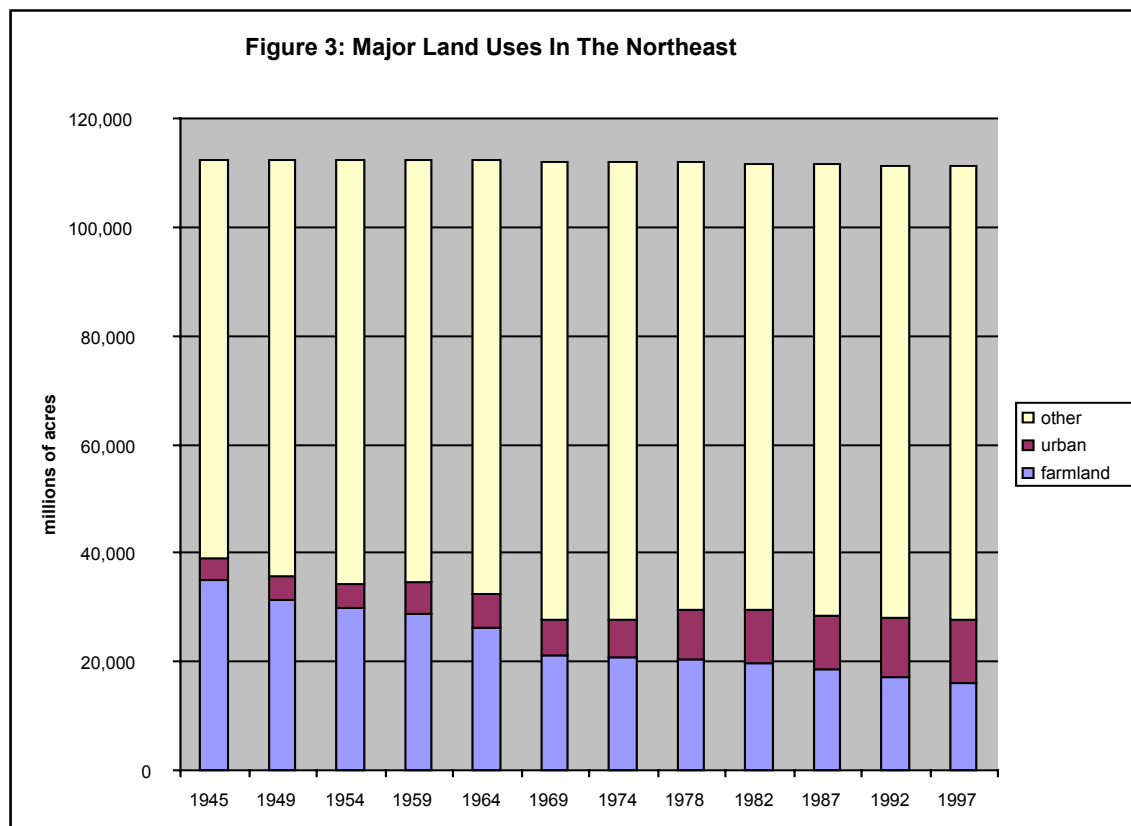
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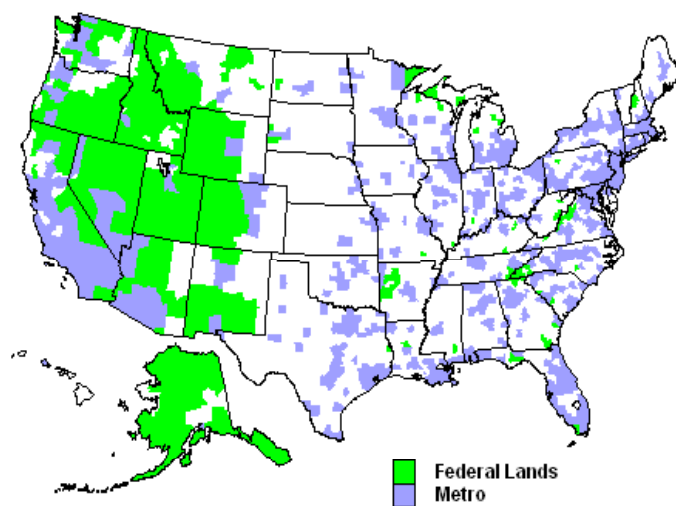
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**Figure 4:
Nonmetro Federal Lands Counties, 1987***



*Counties with 30 percent or more of land area in Federal lands, 1987

Rural Economy Division,
Economic Research Service, USDA,
using data from the Natural Resources Conservation Service, USDA.

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Table 1: Farm Characteristics

	Rural residence	Intermediate	Commercial
Number of farms	1,356,047	655,812	175,091
Share of Farms	62.0%	30.0%	8.0%
Avg. Value of Production	\$10,074	\$64,117	\$687,065
Share of Production	8%	24%	68%
Gross Farm Income	\$17,952	\$76,237	\$609,810
Net Farm Income	\$2,310	\$12,998	\$115,832
Gov't Payments	\$1,437	\$9,254	\$41,218
Share of Payments	13%	40%	47%
Total Household Earnings	\$67,371	\$43,390	\$135,397

Category Definitions

Rural residence: Gross sales below \$250,000 and farming is a secondary activity for the operator

Intermediate: Gross sales below \$250,000 but farming is the main operator activity

Commercial: Gross sales above \$250,000.

Source: USDA Food and Agricultural Policy

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